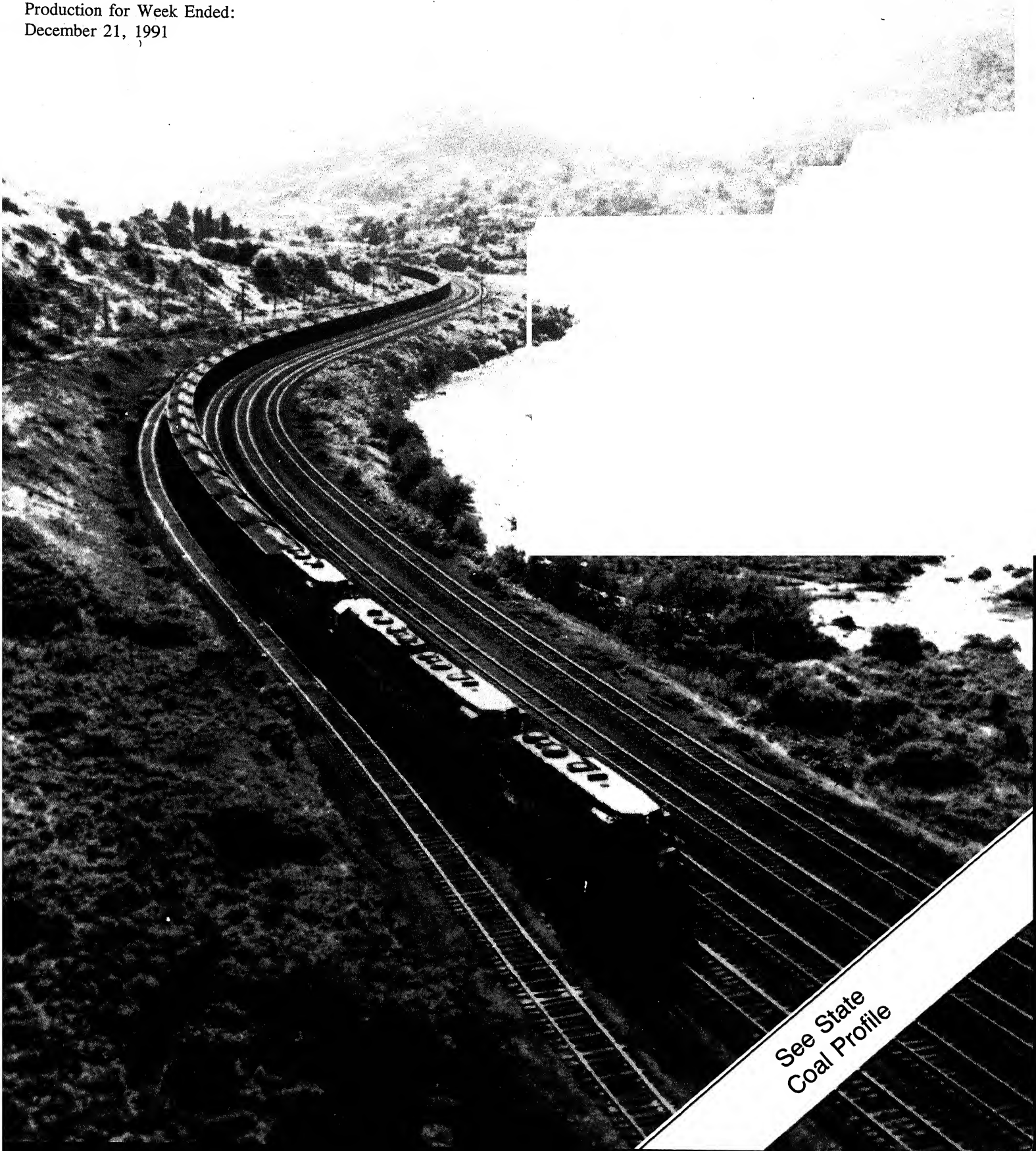




Energy
Information
Administration

Weekly Coal Production

Production for Week Ended:
December 21, 1991



See State
Coal Profile

Preface

The *Weekly Coal Production (WCP)* report provides weekly estimates of U.S. coal production by State. Supplementary data are usually published monthly in two supplements: the Coal Exports and Imports Supplement and the Domestic Market Supplement. The Coal Exports and Imports Supplement contains detailed monthly data on U.S. coal and coke exports and imports. The Domestic Market Supplement contains detailed monthly electric utility coal statistics, by Census Division and State, for generation, consumption, stocks, receipts, sulfur content, prices, and the origin and destination of coal shipments. This supplement also contains summary-level, monthly data for all coal-consuming sectors on a quarterly basis.

Preliminary coal production data are published quarterly, based on production data collected using Form EIA-6, "Coal Distribution Report." Based on 1988 through 1990 data, the coal production estimation error for a quarter at the national level (i.e., the difference between the sum of the weekly estimates for a quarter and the quarterly EIA-6 preliminary data) ranges from 1 percent to 4 percent for 1988, 1 percent to 2 percent for 1989, and 0.3 percent to 3 percent for 1990.

Final coal production data are published annually, based on the EIA-7A coal production survey. Based on 1988 through 1990 data, the revision error for a

quarter at the national level (i.e., the difference between the EIA-6 preliminary data and the EIA-7A final data) ranges from 0.02 percent to 0.08 percent for 1988, 0.09 percent to 0.14 percent for 1989, and 0.01 percent to 0.05 percent for 1990. Usually the EIA-7A coal production data are higher than the EIA-6 coal production data, due to the differences in the threshold reporting requirements.

This publication is prepared by the Survey Management Division; Office of Coal, Nuclear, Electric and Alternate Fuels; Energy Information Administration (EIA) to fulfill its data collection and dissemination responsibilities as specified in the Federal Energy Administration Act of 1974 (P.L. 93-275) as amended. *Weekly Coal Production* is intended for use by industry, press, State and local governments, and consumers. Other publications that may be of interest are the quarterly *Coal Distribution*, the *Quarterly Coal Report*, *Coal Production 1990*, and *Coal Data: A Reference*.

This publication was prepared by Wayne M. Watson under the direction of Mary K. Paull, Team Leader, Coal Data Systems, and Noel C. Balthasar, Chief, Coal and Uranium Data Systems Branch. Specific information about the *State Coal Profile: Virginia* may be obtained from Eugene R. Slatick at 202/254-5384. Questions on energy statistics should be directed to the National Energy Information Center (NEIC) at 202/586-8800.

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State Coal Profile

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Summary

U.S. coal production in the week ended December 21, 1991, as estimated by the Energy Information Administration, totaled 20 million short tons. This was about the same as in the previous week, but 13

percent higher than in the comparable week in 1990. Production east of the Mississippi River totaled 12 million short tons, and production west of the Mississippi River totaled 8 million short tons.

Figure 1. Coal Production

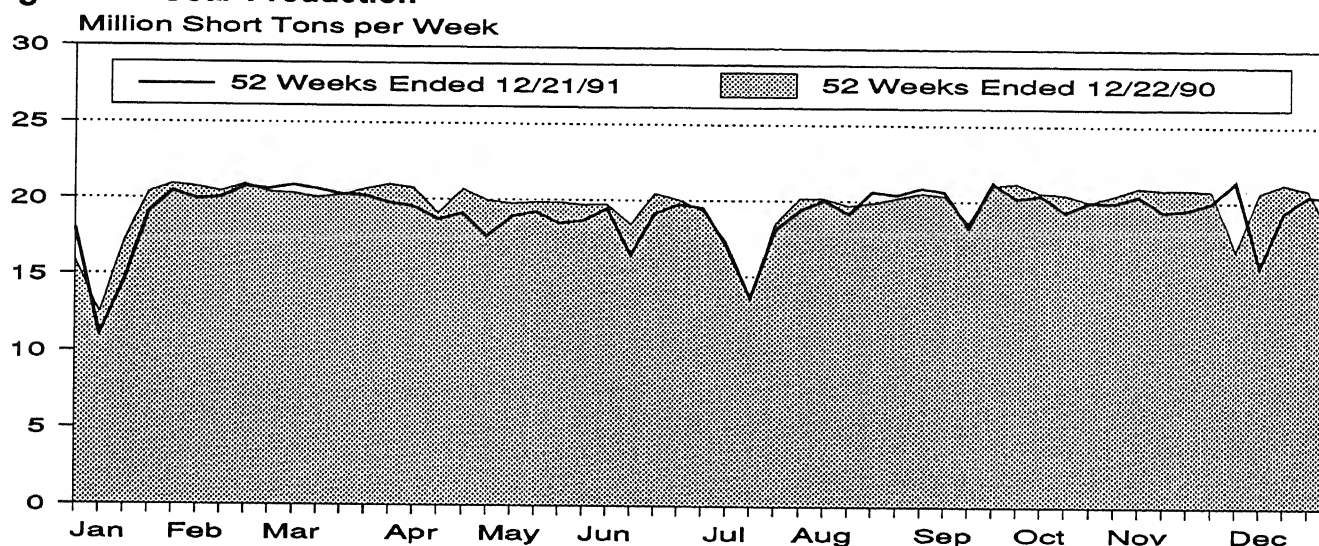


Table 1. Coal Production

	Week Ended			52 Weeks Ended		
Production and Carloadings	12/21/91	12/14/91	12/22/90	12/21/91	12/22/90	Percent Change
Production (Thousand Short Tons)						
Bituminous Coal ¹ and Lignite . . .	20,319	20,420	17,906	996,614	1,024,098	-2.7
Pennsylvania Anthracite	41	47	43	2,688	3,514	-23.5
U.S. Total	20,360	20,467	17,949	999,302	1,027,612	-2.8
Railroad Cars Loaded	133,964	134,705	117,555	6,480,829	6,692,150	

¹Includes subbituminous coal.

Notes: 1991 data are preliminary. Totals may not equal sum of components because of independent rounding.

Sources: Association of American Railroads, Transportation Division, Weekly Statement CS-54A; Energy Information Administration, Form EIA-6, "Coal Distribution Report"; Form EIA-7A, "Coal Production Report"; and State mining agency coal production reports.

Table 2. Coal Production by State
(Thousand Short Tons)

Region and State	Week Ended		
	12/21/91	12/14/91	12/22/90
Bituminous Coal¹ and Lignite			
East of the Mississippi	11,931	11,966	11,638
Alabama	603	563	518
Illinois	1,287	1,217	1,236
Indiana	578	707	573
Kentucky	3,286	3,164	3,369
Kentucky, Eastern	2,444	2,400	2,534
Kentucky, Western	841	764	835
Maryland	78	77	68
Ohio	516	552	670
Pennsylvania Bituminous	963	1,135	953
Tennessee	100	96	102
Virginia	918	885	860
West Virginia	3,604	3,571	3,290
West of the Mississippi	8,388	8,453	6268
Alaska	39	39	42
Arizona	234	235	230
Arkansas	1	1	1
Colorado	341	336	319
Iowa	7	7	7
Kansas	10	11	11
Louisiana	66	81	34
Missouri	50	50	42
Montana	781	795	617
New Mexico	435	571	363
North Dakota	591	601	419
Oklahoma	54	52	26
Texas	1126	1131	957
Utah	428	429	369
Washington	95	96	85
Wyoming	4130	4018	2748
Bituminous Coal¹ and Lignite Total .	20,319	20,420	17,906
Pennsylvania Anthracite	41	47	43
U.S. Total	20,360	20,467	17,949

¹Includes subbituminous coal.

Notes: 1991 data are preliminary. Totals may not equal sum of components because of independent rounding.
Sources: Association of American Railroads, Transportation Division, Weekly Statement CS-54A; Energy Information Administration, Form EIA-6, "Coal Distribution Report"; Form EIA-7A, "Coal Production Report"; and State mining agency coal production reports.

State Coal Profile: Virginia

Total Area of State:

40,817 square miles

Area Underlain by Coal:

1,940 square miles

Demonstrated Reserve Base of Coal: (January 1, 1991)

3 billion short tons
(1 percent of U.S. total)

First Year of Documented Coal Production:

1748 (50 short tons)

Peak Year of Coal Production:

1990 (47 million short tons)

1990 Coal Production:

47 million short tons
(5 percent of U.S. total)

1990 f.o.b. Mine Price:

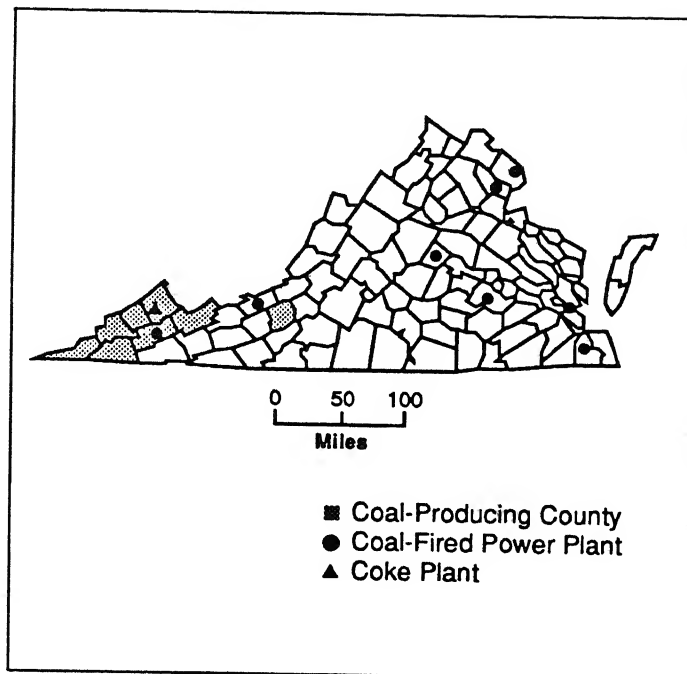
\$28.05 per short ton
(U.S. average = \$21.76)

1990 Coal Consumption:

13 million short tons
(1 percent of U.S. total)

1990 Coal Exports:

19 million short tons
(18 percent of U.S. total)



	<u>Number</u>	<u>Percentage of U.S. Total</u>
Number of Mines (1990)	340	10
Underground	258	15
Surface	82	5
Number of Miners (1990) (at mines producing more than 10,000 short tons)	10,342	8
Underground	8,955	11
Surface	1,387	3
Average Quality of Utility Coal Receipts (1990)	<u>Virginia</u>	<u>U.S. Average</u>
Heat Content (million Btu per short ton)	25.4	20.9
Sulfur Content (percent by weight)	1.0	1.3
Ash Content (percent by weight)	9.8	9.9

Coal is the most valuable of Virginia's mineral commodities. The 1990 coal production of 47 million short tons was valued at more than \$1 billion and accounted for about two-thirds of the total value of all minerals produced in the State, including crude oil and natural gas. Virginia's coal production in 1990 ranked 7th nationally.

Coal occurs in Virginia in three widely separate areas: the Eastern fields, consisting of two basins located west of Richmond; the Valley fields, comprising narrow coal-bearing areas in the west-central part of the State; and the Southwest field, which is part of the Appalachian coal basin. The Southwest field contains most of Virginia's coal reserves and is the source of virtually all of the State's coal production.

Only bituminous coal is currently produced in Virginia, although semianthracite has been produced in the Valley fields. As mined, the bituminous coal has a high heat value, averaging about 25 million Btu per short ton. The sulfur content averages about 1 percent (by weight) and the ash content generally is about 10 percent. About half of Virginia's coal output is estimated to be metallurgical coal, used to make coke for the iron and steel industry in the United States and other countries.

Coal production is from more than 40 coalbeds, which generally are 4 to 5 feet thick. Nearly half of the coal produced in 1990 was from four coalbeds: the Pocahontas No. 3, Jawbone, Splash Dam, and Dorchester. Of these, the Pocahontas No. 3 accounted for 21 percent of Virginia's 1990 coal output. This bed, which is also mined in West Virginia, is an important source of metallurgical coal and ranks as one of the major coalbeds in the United States.

Coal was discovered in Virginia around 1700 along the James River, west of Richmond. The first commercial production of coal in the United States began in that area in 1748. Annual coal production was small until after the Revolutionary War because of the abundance of wood and competition from foreign coal. When tariffs were imposed on imported coal in 1794, coal production from the Richmond area increased. Consumers of this coal included local blacksmiths and iron foundries; some coal was also shipped to Philadelphia and New York. Production of Richmond coal rose to a peak of 175,000 short tons in 1835 and ended in the 1920's, due to competition from other coalfields. Large-scale production from the Valley coalfields began in the late 1800's, when railroads were constructed to the mines. After reaching more than 200,000 short tons annually in the 1930's and early 1940's, the output from the Valley coalfields virtually

ended in 1971. The Southwest coalfield became the center of Virginia's coal industry in the late 1800's, when an extensive railroad system linked the area with coal consumers in Virginia and other States and to ports at Norfolk, Virginia. Coke production began in the Southwest field in 1883.

Annual coal production in Virginia reached 1 million short tons before the turn of the century and grew to 14 million short tons in 1926. Production fell below 8 million short tons during the Depression, but later recovered and rose to 20 million short tons during World War II. In the decade following the war, the State's coal industry suffered losses as railroads converted from coal to oil, and heating fuel markets switched to oil and natural gas. Virginia's coal production declined to a postwar low of about 16 million short tons in 1949. Production rebounded in the 1960's, rising above 30 million short tons annually. Initially, the increase was due largely to a growing demand for coking coal. Later, the upward trend was sustained by a rising demand for utility coal. In 1990, Virginia's coal output reached a record of 47 million short tons.

Underground mines have always produced most of Virginia's coal. In 1990, they accounted for 39 million short tons, or more than 80 percent of the State's total. Seven underground mines produced more than 1 million short tons each. Although these mines represented only 2 percent of the number of mines in Virginia, their combined output of 12 million short tons was about one-fourth of the total coal produced in the State. Nearly three-fourths of the coal produced underground was by continuous mining, which began in the State in the 1950's. Longwall mining was introduced in Virginia in the 1960's. In 1990, the 11 longwall systems in operation accounted for about one-fourth of the State's underground coal output. The small balance of the underground tonnage was from conventional mining. Surface coal mining in Virginia began in the 1920's and reached a peak in the mid 1970's. In 1990, production from surface mines was 8 million short tons. Productivity in 1990 averaged about 2 short tons per hour at underground mines and nearly 3 short tons per hour at surface mines. Both rates were slightly below the average for the Appalachian Region. About 40 coal preparation plants are in operation in Virginia.

Of the coal produced in Virginia in 1990, about 60 percent was for U.S. markets and the rest was exported. Only about 20 percent of the domestic shipments went to consumers in Virginia. A little more than half of the out-of-State shipments was utility coal, delivered mostly to power plants in North Carolina and Georgia. Nearly one-third was coking coal for consumers chiefly in Ohio, Pennsylvania, West Virginia, and Indiana.

In 1990, exports of coal produced in Virginia totaled about 19 million short tons, which ranked Virginia as the second-largest coal-exporting State, following West Virginia. About 90 percent of Virginia's coal exports were estimated to be metallurgical coal. Norfolk, Virginia, is the leading U.S. Customs District for coal exports, handling coal from Virginia and other States. In 1990, coal exports through Norfolk amounted to 55 million short tons, accounting for 52 percent of U.S. coal exports.

Coal consumption in Virginia in 1990 totaled 13 million short tons. Electric utilities were the largest consumers, using 8 million short tons. About 40 percent of the utility coal was produced in Virginia, with nearly all of the balance received from Kentucky and West Virginia. For every ton of Virginia coal used, the utilities receive a \$1 tax credit. Shipments of coking coal to Virginia's only coke plant, at Vansant, totaled less than 1 million short tons, all produced in Virginia. In addition, a wide range of other industrial users consumed about

4 million short tons of coal, receiving about 20 percent from Virginia and the rest mostly from Kentucky and West Virginia. Among the leading industrial users of coal in Virginia are manufacturers of paper, paperboard, and synthetic fibers.

At the beginning of 1991, the eight coal-fired power plants in Virginia had a net summer electricity generating capability of 4,225 megawatts. This was 31 percent of the total generating capability in the State. In 1990, these plants accounted for 44 percent of the 47 billion kilowatthours produced in Virginia. By comparison, the State's two nuclear power plants, which held 25 percent of its generating capability, produced slightly more than half of its electricity. Historically, coal has been the dominant energy source for generating electricity in Virginia. Oil became the leading utility fuel in the early 1970's, but its use later declined due to rising oil prices. During the 1980's, generation from both coal and nuclear power increased, becoming equally important. Virginia's largest coal-fired power plant



About half of the U.S. coal exported annually is through the Norfolk, Virginia, Customs District.

is the 1,250-megawatt Chesterfield Plant, operated by the Virginia Electric and Power Company, in Chesterfield County. It is the third-largest power plant in the State, following the North Anna and the Surry nuclear plants, also operated by the Virginia Electric and Power Company.

In September 1991, the U.S. Department of Energy (DOE) selected a coal gasification project in Wise County as part of its Clean Coal Technology Program. DOE will fund nearly half of the estimated \$219.1 million cost of the project, and private companies will finance the balance. The project calls for the construction of a power plant at a coal mine near Coeburn to demonstrate an integrated coal gasification combined cycle process. Electricity totaling 107 megawatts will be generated from two gas turbines (one fired with coal gas and one with natural gas) and a steam turbine. In addition, the plant will supply steam to a nearby coal preparation plant.

Annual coal production in Virginia is projected to total about 45 million short tons in 1992. The effect of the 1990 Clean Air Act Amendments is uncertain, although several studies indicate that it will have a positive impact on the utility market for Virginia's low-sulfur coal. The outlook for coal exports from Virginia is expected to improve due to reduced government subsidies in Europe after 1992. In addition, all of Virginia's coalfields are thought to have potential for commercial development as sources of coalbed methane. Most of the coalbed methane projects have focused on the Pocahontas No. 3 coalbed in the Southwest field.

References

Energy Information Administration: *Coal Production* (various issues); *Quarterly Coal Report* (various issues); *Coal Distribution January-December 1990* (April 1991); *Cost and Quality of Fuels for Electric Utility Plants 1990* (August 1991); *Inventory of Power Plants in the United States 1991* (September 1991); *Electric Power Annual* (various issues); *Electric Power Monthly* (March 1991); *State Energy Data Report: Consumption Estimates 1960-1989* (May 1991). "DOE Adds Nine New Clean Coal Technology Projects in Completing Fourth Round of Nationwide Competition," Press Release, U.S. Department of Energy (Washington, DC, September 12, 1991). U.S. Department of the Interior, Bureau of Mines, *State Mineral Summaries 1991*; Geological Survey, Circular 171, *Coal Resources of Virginia* (1952). Virginia Division of Mineral Resources: Publication 85, *Mining History of the Richmond Coalfield of Virginia* (1988); *Virginia Minerals*, Vol. 25, No. 1 (February 1979), "Summary of Coal Resources in Virginia." Virginia Center for Coal and Energy Research, Virginia Polytechnic Institute and State University: *Virginia Energy Patterns and Trends—Virginia Energy Profiles: 1960 to 1990* (October 1991); *1991 Virginia Coal*; *Virginia Coal: An Abridged History* (April 1990). Virginia Coal Council and Coal Technology Committee, *Virginia Coal. 1989 Keystone Coal Industry Manual* (Chicago, IL: Madigan Hunter Publishing Co.). *Quarterly Review of Methane from Coal Seams Technology: "The United States Coalbed Methane Resource,"* Vol. 7, No. 3 (March 1990); "Coalbed Methane Development in the Appalachian Basin," Vol. 8, No. 4 (October-December 1990).

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Weekly Coal Production, updated on Fridays at 5:00 p.m.

Quarterly Coal Report, updated 60 days after the end of the quarter

Electric Power Monthly, updated on the 1st of the month

Monthly Energy Review, updated the last week of the month

Short Term Energy Outlook, updated 60 days after the end of the quarter

Methodology

Weekly Data

Estimates of national weekly coal production are based on weekly carload data collected by the Association of American Railroads (AAR) from its members (Class I Railroads) and certain other railroads. EIA calculates the average number of tons per carload for each railroad's coal car fleet from information obtained from the most recent Quarterly Freight Commodity Statistics filed by Class I Railroads with the Interstate Commerce Commission (ICC) and from data made available by individual railroads. The average number of tons per carload is then multiplied by the number of cars loaded to obtain an estimate of weekly production shipped by AAR railroads.

Next, the weekly coal production estimate for a specific week is obtained by dividing the AAR rail tonnage for the week by a factor representing the proportion of quarterly AAR rail shipments to total quarterly coal production. Because this is done on a weekly basis, and prior to completion of current quarterly statistics, the factor is derived using ICC data on tons per carload and total carloadings and from EIA data on total production for the same quarter of the previous year. Figures for the same quarter of the year are used in order to reflect seasonal variation. In some cases, the ratio of rail tonnage to total production is adjusted to take additional, more current information into consideration, such as rail or coal strikes.

Once the U.S. weekly coal production estimate is determined, this total is split into two subtotals - the portion representing States, with little or no rail coal shipments, and the portion representing the remaining States, where a significant percentage of production is shipped by rail. The States with little or no railroad coal shipments are Alaska, Arizona, California, Georgia, Iowa, Kansas, Louisiana, Missouri, Texas, and Washington. With the exception of California and Louisiana, the weekly production data for each "nonrail" State are developed by multiplying the estimate of U.S. weekly coal production by the ratio of projected production, for each State to U.S. total projected production, for the current quarter. The methodology used to project State coal production is given in the EIA publication *Model Documentation of the Short-Term Coal Analysis System* (DOE/EIA-0394). The EIA contacts the sole producer in Louisiana and California to obtain weekly production data.

Estimates for the remaining States are in aggregate equal to the U.S. weekly coal production minus the estimated production from the nonrail States.

Estimates for "rail States" are based on the AAR carload data compiled by State of origin, including separate estimates for the anthracite and bituminous coal regions in Pennsylvania, eastern and western Kentucky and northern and southern West Virginia.

Each railroad is contacted at least annually for information concerning the distribution (by state of origin) of its railroad carloadings of coal. These distribution percentages are multiplied by the railroad's weekly loadings and ICC derived tonnage per carload figures, to derive the weekly tonnages loaded by State and by railroad. The tonnages loaded by the various railroads are then summed by each State to estimate total production shipped by AAR rail for that State. These tonnages are divided by the most recent ratio of annual AAR rail tonnage to total annual production for each State. The resulting weekly coal production estimates for the rail States are then adjusted to ensure that each State's production figure contributes proportionately to the weekly coal production estimate previously derived in aggregate for the rail States.

Monthly Data

Preliminary estimates of monthly coal production by State are obtained by summing weekly coal production estimates published in the *Weekly Coal Production* report. If a week extends into a new month, the production is allocated by day, and the days are added to the month in which they occur. For weeks without holidays, the allocation is Monday through Friday, 18.4 percent each day; Saturday, 8 percent; and Sunday, 0 percent. For weeks with a holiday occurring on a day other than Sunday, the allocation is Sunday and the holiday, 0 percent; and any other day, 20 percent.

Preliminary weekly and monthly production estimates are revised quarterly when quarterly production data, become available. Preliminary weekly and monthly estimates are proportionately adjusted to conform to the quarterly production figure.

Quarterly Data

Estimates of quarterly coal production are based on data collected quarterly on Form EIA-6, with certain adjustments. The national estimate of quarterly coal production is set equal to the quarterly U.S. coal production total as reported on the Form EIA-6. Based on 1988 through 1990 data, the coal production estimation error for a quarter at the national level (i.e., the difference between the sum of

the weekly estimates for a quarter and the quarterly EIA-6 preliminary data) ranges from 1 percent to 4 percent for 1988, 1 percent to 2 percent for 1989, and 0.3 percent to 3 percent for 1990.

The quarterly production data, although published throughout the year, are considered preliminary until EIA annual production data are finalized in September of the following year. At that time quarterly production data are revised (proportionately adjusted) to conform to the final annual production figures.

Finalizing Annual Production

Preliminary total annual U.S. coal production, as reported in the *Weekly Coal Production* report in the first week in January of the following year, is the sum of revised monthly/quarterly estimates of production for the first 9 months (first three quarters) and a preliminary estimate of fourth quarter production derived from weekly estimates.

When production data for the fourth quarter of the year become available from Form EIA-6 in March of the following year, the preliminary fourth-quarter U.S. total production figure and corresponding State-level figures may or may not be revised, depending on the size of the difference between the estimates and fourth-quarter data. As a general practice, EIA does not revise the initial annual production estimates (determined initially in January of the following year). Weekly, monthly, and quarterly State and national production data are adjusted to conform to finalized annual production figures derived from Form EIA-7A, in September of the following year.

Based on 1988 through 1990 data, the revision error for a quarter at the national level (i.e., the difference between the EIA-6 preliminary data and the EIA-7A final data) ranges from 0.02 percent to 0.08 percent for 1988, 0.09 percent to 0.14 percent for 1989, and 0.01 percent to 0.05 percent for 1990. Usually the EIA-7A coal production data are higher than the EIA-6 coal production data, due to differences in the threshold reporting requirements.